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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/713,633	11/14/2000	Ramarathnam Venkatesan	MS1-650US	3022

22801 7590 11/03/2004

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EXAMINER	
YIGDALL, MICHAEL J	

ART UNIT	PAPER NUMBER
2122	

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	09/713,633	VENKATESAN ET AL.	
	Examiner	Art Unit	
	Michael J. Yigdall	2122	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 June 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-15 and 18-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-15 and 18-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/16/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's response and amendment filed on June 4, 2004 has been fully considered. Claims 1-15 and 18-22 remain pending.

Response to Arguments

2. Applicant's arguments with respect to Schweitz and Chipman have been considered but are moot in view of the new ground(s) of rejection. Specifically, claims 1-15 and 18-22 are now rejected as being unpatentable over Schweitz in view of Hsu, as set forth below.

Claim Objections

3. Claim 13 is objected to because of the following informalities: The status of claim 13 is identified as "original" in the present listing of claims rather than as --currently amended-- (see page 6). Appropriate correction is requested.

4. Claim 22 is objected to because of the following informalities: The claim is identified as claim "23" in the present listing of claims rather than as claim --22-- (see page 10). Appropriate correction is requested.

Claim Rejections - 35 USC § 112

5. The rejection of claims 9 and 13-15 under 35 U.S.C. 112, second paragraph, is withdrawn in view of the amendment.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claims 1-15 and 18-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pat. No. 6,594,822 to Schweitz et al. (art of record; herein "Schweitz") in view of U.S. Pat. No. 5,974,254 to Hsu (herein "Hsu").

With respect to claim 1 (currently amended), Schweitz discloses a method for generating a delta between a first program binary and a second program binary (see the abstract), the method comprising the steps of:

(a) obtaining a first control flow graph (CFG) representation of the first binary and obtaining a second CFG representation of the second binary (see graphs 150 and 155 in FIG. 2);

(b) comparing the first and second CFG representations to identify blocks (nominally matched blocks) that match in the first and second CFG representations, thereby identifying blocks (nominally unmatched blocks) in the second CFG representation that do not match in the first CFG representation (see column 4, lines 28-29).

Although Schweitz discloses comparing the content of the blocks (see FIG. 3C), Schweitz does not expressly disclose the limitation wherein the comparing is based upon content of blocks being compared and local neighborhoods of blocks surrounding blocks being compared, wherein a local neighborhood of a particular block consists of blocks neighboring that block in a CFG representation, but less than all the blocks in that CFG representation.

However, Hsu discloses a method for determining the differences between two graphical programs (see the abstract). Similarly to Schweitz, Hsu discloses the steps of obtaining first and

second graph representations (see column 4, lines 46-56) and matching or comparing the graphs to identify similarities and differences (see column 4, line 57 to column 5, line 6). Hsu further discloses comparing sub-graphs of the graph representations (see step 150 in FIG. 10) and examining local neighborhoods (see step 128 in FIG. 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the method of Schweitz with the comparison features taught by Hsu, for the purpose of creating a software patch (see Schweitz, abstract) to address the differences found between two graphical programs (see Hsu, abstract).

Therefore, Schweitz in view of Hsu discloses step (b) above, including the limitation wherein the comparing is based upon content of blocks being compared and local neighborhoods of blocks surrounding blocks being compared, wherein a local neighborhood of a particular block consists of blocks neighboring that block in a CFG representation, but less than all the blocks in that CFG representation.

Schweitz in view of Hsu further discloses the steps of:

(c) determining edit-operations that merges the unmatched blocks into the first CFG representation so that first CFG representation is substantially identical to the second CFG representation (see Schweitz, column 4, lines 29-32);

(d) producing a delta comprising the unmatched blocks and the edit-operations (see Schweitz, column 4, lines 11-15).

With respect to claim 2 (original), Schweitz in view of Hsu further discloses a method for transmitting a delta (see column 1, lines 58-60) comprising:

(a) a method for generating a delta as recited in claim 1 (see Schweitz and Hsu as applied to claim 1 above);

(b) transmitting the delta over a network (see Schweitz, column 1, lines 58-60).

With respect to claim 3 (original), Schweitz in view of Hsu further discloses a method for patching a copy of the first program binary (see Schweitz, abstract), the method comprising:

(a) a method for generating a delta as recited in claim 1 (see Schweitz and Hsu as applied to claim 1 above);

(b) patching the copy of the first program binary so that the copy is substantially identical to the second program binary, wherein the delta guides such patching (see Schweitz, column 1, lines 25-28).

With respect to claim 4 (currently amended), Schweitz in view of Hsu further discloses a method as recited in claim 1, wherein a local neighborhood of a particular block consists of those blocks immediately adjacent that block (see Hsu, column 13, lines 60-63, which shows that a local neighborhood consists of immediate neighbors).

With respect to claim 5 (currently amended), Schweitz in view of Hsu further discloses the limitation wherein a local neighborhood of a particular block is augmented with a random sampling of blocks from a substantially large neighborhood of blocks surrounding that block (see Hsu, column 13, lines 60-67, which shows that a local neighborhood is augmented with surrounding objects or blocks).

With respect to claim 6 (original), Schweitz in view of Hsu further discloses a computer-readable medium having embodied thereon a data structure, comprising a delta generated in accordance with the steps recited in claim 1 (see Schweitz, column 10, lines 3-6, and see Schweitz and Hsu as applied to claim 1 above).

With respect to claim 7 (original), Schweitz in view of Hsu further discloses a computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in claim 1 (see Schweitz, column 9, lines 54-55, and see Schweitz and Hsu as applied to claim 1 above).

With respect to claim 8 (original), Schweitz discloses a method for matching blocks between a first control flow graph (CFG) representation of a portion of a first program and a second CFG representation of a portion of a second program (see the abstract, and see graphs 150 and 155 in FIG. 2), the method comprising:

(a) matching blocks between the first and second CFG representations based upon the content of the blocks (see FIG. 3C);

(b) detecting outliers, wherein outliers are blocks in the first CFG representation that do not match any block in the second CFG representation during the matching step (see column 4, lines 29-32).

Schweitz does not expressly disclose the step of:

(c) computing a neighborhood of each block in the first and second CFG representation by performing a breadth first traversal.

However, Hsu discloses matching the graph representations of first and second programs to identify similarities and differences (see column 4, line 46 to column 5, line 6). Hsu further discloses traversing the graphs (see column 14, lines 65-67) and examining the neighborhoods in the graphs (see column 13, lines 60-63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the method of Schweitz with the neighborhood features taught by Hsu, for the purpose of creating a software patch (see Schweitz, abstract) to address the differences found between two graphical programs (see Hsu, abstract).

Therefore, Schweitz in view of Hsu discloses step (c) above.

Schweitz in view of Hsu further discloses the step of:

(d) removing the outliers from each neighborhood (see Schweitz, column 1, lines 25-28 and column 4, lines 29-32).

With respect to claim 9 (currently amended), Schweitz in view of Hsu further discloses:

(a) computing labels for each block in first and second CFG representations based upon content of a block (see Schweitz, column 6, lines 57-59, which shows associating labels with each cantle or block);

(b) for each neighborhood computed in the computing step, forming a "d-label" for each block in a neighborhood based upon labels of the blocks within the neighborhood (see Schweitz, column 9, lines 1-9, which shows comparing names and hash values, i.e. d-labels);

(c) attempting to match blocks between first and second CFG representations by comparing the d-labels of the blocks (see Schweitz, FIG. 3C).

With respect to claim 10 (original), Schweitz in view of Hsu further discloses a computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in claim 8 (see Schweitz, column 9, lines 54-55, and see Schweitz and Hsu as applied to claim 8 above).

With respect to claim 11 (currently amended), Schweitz discloses a method for matching procedures between a first control flow graph (CFG) representation of a portion of a first program and a second CFG representation of a portion of a second program (see the abstract, and see graphs 150 and 155 in FIG. 2), wherein a procedure comprises multiple blocks in a CFG representation (see column 5, lines 58-62, which shows that a function or procedure comprises multiple nodes or blocks in a graph representation).

Although Schweitz discloses comparing the content and lengths of functions or procedures to determine the number of matching nodes or blocks (see column 9, lines 5-8), Schweitz does not expressly disclose:

(a) computing a procedure-match-criterion for a procedure in the second CFG representation, where the procedure-match-criterion for a procedure in the second CFG representation represents the number of matching blocks between that procedure and a specified procedure in the first CFG representation;

However, Hsu discloses matching the graph representations of first and second programs to identify similarities and differences (see column 4, line 46 to column 5, line 6). Hsu further discloses computing a score or criterion that represents the degree of matching between portions of the first and second programs (see column 9, lines 32-36).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the method of Schweitz with the matching criterion features taught by Hsu, for the purpose of creating a software patch (see Schweitz, abstract) to address the differences found between two graphical programs (see Hsu, abstract).

Therefore, Schweitz in view of Hsu discloses step (a) above.

Schweitz in view of Hsu further discloses the step of:

(b) matching procedures in the second CFG representation with the specified procedure in the first CFG representation based upon the procedure-match-criteria for the procedures in the second CFG representation (see Schweitz, FIG. 3C).

With respect to claim 12 (original), Schweitz in view of Hsu further discloses a computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in claim 11 (see Schweitz, column 9, lines 54-55, and see Schweitz and Hsu as applied to claim 11 above).

With respect to claim 13 (currently amended), Schweitz discloses a method for matching of blocks in a procedure of a first control flow graph (CFG) representation of a portion of a first program between an ostensibly matching procedure of second CFG representation of a portion of second program (see the abstract, and see graphs 150 and 155 in FIG. 2), the method comprising:

(a) matching blocks between the first and second CFG representations based upon the content of the blocks (see FIG. 3C);

Schweitz does not expressly disclose the step of:

(b) computing successively smaller neighborhoods of each block in the first and second CFG representations via breadth first traversals.

However, Hsu discloses matching the graph representations of first and second programs to identify similarities and differences (see column 4, line 46 to column 5, line 6). Hsu further discloses successively traversing the graphs (see column 14, lines 65-67) and smaller sub-graphs (see column 15, lines 46-50), and examining the neighborhoods (see column 13, lines 60-63).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the method of Schweitz with the neighborhood features taught by Hsu, for the purpose of creating a software patch (see Schweitz, abstract) to address the differences found between two graphical programs (see Hsu, abstract).

Therefore, Schweitz in view of Hsu discloses step (c) above.

Schweitz in view of Hsu further discloses the step of:

(c) for each neighborhood computed in the computing step, forming a “d-label” for each block in a neighborhood based upon labels of the blocks within the neighborhood (see Schweitz, column 9, lines 1-9, which shows comparing names and hash values, i.e. d-labels);

(d) attempting to match blocks between first and second CFG representations by comparing the d-labels of the blocks (see Schweitz, FIG. 3C).

With respect to claim 14 (original), Schweitz in view of Hsu further discloses the limitation wherein at least one neighborhood computed in the computing steps is augmented with a random sampling of blocks in the complete representation of the neighborhood (see Hsu, column 13, lines 60-67, which shows that a local neighborhood is augmented with surrounding objects or blocks).

With respect to claim 15 (original), Schweitz in view of Hsu further discloses a computer-readable medium having computer-executable instructions that, when executed by a computer, performs the method as recited in claim 13 (see Schweitz, column 9, lines 54-55, and see Schweitz and Hsu as applied to claim 13 above).

With respect to claim 18 (currently amended), Schweitz discloses a patch data structure (see the abstract) generated in accordance with the following acts:

(a) providing a server computer in a communications with a communications network (see column 1, lines 58-60; note that a server computer is inherently provided to deliver a patch through a communications network);

(b) receiving input from a client computer by way of the communications network, the input providing a parameter indicative of a request for upgrading a copy of a first program binary to a match a second program binary (see column 1, lines 25-28 and 53-60; note that input is inherently received to deliver a patch through a communications network);

(c) retrieving a delta between a first program binary and the second program binary (see column 4, lines 11-15), wherein computing such delta comprises the steps of:

(i) obtaining a first control flow graph (CFG) representation of the first binary and obtaining a second CFG representation of the second binary (see graphs 150 and 155 in FIG. 2);

(ii) comparing the first and second CFG representations to identify blocks (nominally matched blocks) that match in the first and second CFG representations, thereby

identifying blocks (nominally unmatched blocks) in the second CFG representation that do not match in the first CFG representation (see column 4, lines 28-29).

Although Schweitz discloses comparing the content of the blocks (see FIG. 3C), Schweitz does not expressly disclose the limitation wherein the comparing is based upon content of blocks being compared and local neighborhoods of blocks surrounding blocks being compared, wherein a local neighborhood of a particular block consists of blocks neighboring that block in a CFG representation, but less than all the blocks in that CFG representation.

However, Hsu discloses a method for determining the differences between two graphical programs (see the abstract). Similarly to Schweitz, Hsu discloses the steps of obtaining first and second graph representations (see column 4, lines 46-56) and matching or comparing the graphs to identify similarities and differences (see column 4, line 57 to column 5, line 6). Hsu further discloses comparing sub-graphs of the graph representations (see step 150 in FIG. 10) and examining local neighborhoods (see step 128 in FIG. 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the method of Schweitz with the comparison features taught by Hsu, for the purpose of creating a software patch (see Schweitz, abstract) to address the differences found between two graphical programs (see Hsu, abstract).

Therefore, Schweitz in view of Hsu discloses step (ii) above, including the limitation wherein the comparing is based upon content of blocks being compared and local neighborhoods of blocks surrounding blocks being compared, wherein a local neighborhood

of a particular block consists of blocks neighboring that block in a CFG representation, but less than all the blocks in that CFG representation.

Schweitz in view of Hsu further discloses the steps of:

(iii) determining edit-operations that merges the unmatched blocks into the first CFG representation so that first CFG representation is substantially identical to the second CFG representation (see Schweitz, column 4, lines 29-32);

(iv) producing a delta comprising the unmatched blocks and the edit-operations (see Schweitz, column 4, lines 11-15);

(d) generating the patch data structure as a function of the delta (see Schweitz, column 4, lines 29-32).

With respect to claim 19 (original), Schweitz in view of Hsu further discloses a method for transmitting a patch data structure comprising transmitting a patch data structure as recited in claim 18 over a communications network (see Schweitz, column 1, lines 58-60, and see Schweitz and Hsu as applied to claim 18 above).

With respect to claim 20 (original), Schweitz in view of Hsu further discloses a method for patching a copy of the first program binary at a client computer (see Schweitz, abstract), the method comprising patching the copy of the first program binary so that the copy is substantially identical to the second program binary, wherein a delta in a patch data structure as recited in claim 18 guides such patching (see Schweitz, column 1, lines 25-28, and see Schweitz and Hsu as applied to claim 18 above).

With respect to claim 21 (currently amended), Schweitz discloses a delta-generator system (see the abstract), comprising:

(a) a comparator that is configured to compare a first control flow graph (CFG) representation of a first program binary and a second CFG representation of the second program binary for identifying blocks (nominally matched blocks) that match in the first and second CFG representations, thereby identifying blocks (nominally unmatched blocks) in the second CFG representation that do not match in the first CFG representation (see graphs 150 and 155 in FIG. 2, and see column 4, lines 28-29).

Schweitz does not expressly disclose the limitation wherein the comparison is based upon content of blocks being compared and local neighborhoods of blocks surrounding blocks being compared, wherein a local neighborhood of a particular block consists of blocks neighboring that block in a CFG representation, but less than all the blocks in that CFG representation.

However, Hsu discloses a method for determining the differences between two graphical programs (see the abstract). Similarly to Schweitz, Hsu discloses the steps of obtaining first and second graph representations (see column 4, lines 46-56) and matching or comparing the graphs to identify similarities and differences (see column 4, line 57 to column 5, line 6). Hsu further discloses comparing sub-graphs of the graph representations (see step 150 in FIG. 10) and examining local neighborhoods (see step 128 in FIG. 8).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to supplement the method of Schweitz with the comparison features taught by Hsu, for the purpose of creating a software patch (see Schweitz, abstract) to address the differences found between two graphical programs (see Hsu, abstract).

Therefore, Schweitz in view of Hsu discloses part (a) above, including the limitation wherein the comparison is based upon content of blocks being compared and local neighborhoods of blocks surrounding blocks being compared, wherein a local neighborhood of a particular block consists of blocks neighboring that block in a CFG representation, but less than all the blocks in that CFG representation.

Schweitz in view of Hsu further discloses:

(b) an edit-op determiner configured to determine the edit-operations that merges the unmatched blocks into the first CFG representation so that first CFG representation is substantially identical to the second CFG representation (see Schweitz, column 4, lines 29-32);

(c) an output sub-system that is configured to produce a delta comprising the unmatched blocks and the edit-operations (see Schweitz, column 4, lines 11-15).

With respect to claim 22 (original), Schweitz in view of Hsu further discloses a computer-readable medium having embodied thereon a data structure comprising a delta produced by the system as recited in claim 21 (see Schweitz, column 10, lines 3-6, and see Schweitz and Hsu as applied to claim 21 above).

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Yigdall whose telephone number is (571) 272-3707. The examiner can normally be reached on Monday through Friday from 7:30am to 4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tuan Q. Dam can be reached on (571) 272-3695. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MY

Michael J. Yigdall
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